Patent claims

1. A method for controlling the air flow L in a level control system for a motor vehicle, which contains the following components:

- a compressor (6),
- a compressed air accumulator (4) which can be filled with air from the atmosphere and which can be emptied into the atmosphere,
- at least one pneumatic spring (2a, ..., 2d), the pneumatic spring (2a, ..., 2d) being connected to the compressed air accumulator (4) via the compressor (6) in such a way that compressed air can be transferred out of the pneumatic spring (2a, ..., 2d) into the compressed air accumulator (4) and in the opposite direction,

control taking place in such a way that the air flow L is located within specific limits,

characterized in that

- two air flow intervals I_1, I_2 are predetermined, the first air flow interval I_1 lying within the second air flow interval I_2, and the first air flow interval I_1 having a first upper limit O_1 and a first lower limit U_1 and the second air flow interval I_2 a second upper limit O_2 and a second lower limit U_2, and,
- in any event, control of the air flow L into the second air flow interval I_2 being carried out when the air flow L lies outside the second air flow interval I_2 before control, and,
- under specific predetermined preconditions, control of the air flow L into the first air flow interval I_1 is carried out when the air flow L lies outside the first air flow interval I_1 and within the second air flow interval I_2 before control.

2. The method for controlling the air flow L in the level control system for a motor vehicle as claimed in

claim 1, characterized in that, in the event that the air flow L lies outside the second air flow interval I_2, control is carried out in such a way that, after control, the air flow L

- lies between the second lower limit U_2 and the first lower limit U_1 when the air flow L lay below the second lower limit U_2 before control, and,
- lies between the second upper limit O_2 and the first upper limit O_1 when the air flow L lay above the second upper limit O_2 before control.

3. The method for controlling the air flow L in the level control system for a motor vehicle as claimed in either one of claims 1 and 2, characterized in that, when the air flow L lies outside the first air flow interval I_1 and within the second air flow interval I_2, control of the air flow L into the first air flow interval I_1 is carried out under the precondition that the motor vehicle has previously been put into operation.

4. The method for controlling the air flow L in the level control system for a motor vehicle as claimed in claim 3, characterized in that control of the air flow L into the first air flow interval I_1 is carried out under the additional precondition that a specific time span has elapsed after the motor vehicle has been put into operation.

5. The method for controlling the air flow in a level control system for a motor vehicle as claimed in claim 3, characterized in that, after the motor vehicle has been put into operation, measurements of the air flow L are carried out, and control of the air flow L into the first air flow interval I_1 is carried out under the additional precondition that the measured air flow L has stabilized.

6. The method for controlling the air flow L in a level control system for a motor vehicle as claimed in one of claims 1 to 5, characterized in that, when the air flow L lies below the second lower limit U_2 and the level of the motor vehicle is below a safe level, first, the motor vehicle is lifted to a safe level, and then control of the air flow L takes place in such a way that the air flow L lies above the second lower limit U_2 after control.

7. The method for controlling the air flow L in a level control system for a motor vehicle as claimed in claim 6, characterized in that, to lift the motor vehicle to a safe level, first, the compressed air present in the compressed air accumulator (4) is used, and, if this is not sufficient for lifting to the safe level, to lift the motor vehicle further, compressed air is sucked in from the atmosphere.

8. The method for controlling the air flow L in a level control system for a motor vehicle as claimed in claim 7, characterized in that in the event that compressed air is transferred out of the atmosphere into the level control system, the following procedure is adopted:

- the air flow L_1 in the level control system is determined,
- compressed air is transferred out of the atmosphere directly into at least one of the pneumatic springs (2a, ..., 2d),
- then, the air flow L_2 in the level control system is determined,
- the differential air flow $\Delta L = L_1 - L_2$ is determined,
- a scavenging air flow is determined by means of the differential air flow ΔL,
- the scavenging air flow is transferred from the atmosphere into the compressed air accumulator (4)

via an air drier (5),

- an air flow corresponding to the scavenging air flow is discharged from the compressed air accumulator (4) into the atmosphere via the air drier (5).

9. The method for controlling the air flow L in a level control system for a motor vehicle as claimed in claim 8, characterized in that the scavenging air flow is transferred into the compressed air accumulator (4) once or in a plurality of cycles.

10. The method for controlling the air flow L in a level control system for a motor vehicle as claimed in one of claims 1 to 7, characterized in that, in the event that compressed air is transferred from the atmosphere into the level control system, the following procedure is adopted:

- the air flow L_1 in the level control system is determined,
- compressed air is transferred from the atmosphere into the level control system via an air drier (5),
- then, the air flow L_2 in the level control system is determined,
- the differential air flow $\Delta L = L_1 - L_2$ is determined,
- a regeneration air flow which is necessary in order to regenerate the air drier (5) is determined by means of the differential air flow ΔL,
- at least the regeneration air flow is transferred from the atmosphere into the level control system via the air drier (5) and is discharged into the atmosphere again via the air drier (5) for the regeneration of the latter.

11. The method for controlling the air flow L in a

level control system for a motor vehicle as claimed in one of claims 8 to 10, characterized in that, in addition to the scavenging air flow or regeneration air flow, an air flow L_z is transferred into the compressed air accumulator (4) via the air drier (5) and is dimensioned such that, after the transfer of this air flow L_z, the air flow L in the level control system lies above the second lower limit U_2.

12. The method for controlling the air flow L in a level control system for a motor vehicle as claimed in one of claims 1 to 11, characterized in that, when the air flow L lies above the second upper limit O_2 and the level of the motor vehicle is above a safe level, compressed air is discharged from the pneumatic springs (2a, ..., 2d) simultaneously into the compressed air accumulator (4) and into the atmosphere.

13. The method for controlling the air flow L in a level control system for a motor vehicle as claimed in claim 12, characterized in that compressed air is discharged from the pneumatic springs (2a, ..., 2d) until the motor vehicle is at a safe level.

14. A level control system for a motor vehicle for carrying out the method as claimed in one of claims 1 to 9, which contains the following components:

- a compressor (6),
- a compressed air accumulator (4) which can be filled with air from the atmosphere and can be emptied into the atmosphere,
- at least one pneumatic spring (2a, ..., 2d), the pneumatic spring (2a, ..., 2d) being connected to the compressed air accumulator (4) via the compressor (6) in such a way that compressed air can be transferred out of the pneumatic spring (2a, ..., 2d) into the compressed air accumulator (4) and in the opposite direction,

- a control unit (36) which carries out a control of the air flow L in the level control system in such a way that the air flow L is located within specific limits,

characterized in that

two air flow intervals I_1, I_2 are predetermined in the control unit (36), the first air flow interval I_1 lying within the second air flow interval I_2, and the first air flow interval I_1 having a first upper limit O_1 and a first lower limit U_1 and the second air flow interval I_2 a second upper limit O_2 and a second lower limit U_2.